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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,994	08/02/2001	Rui Xie	D-6400 CIP	8016
7590	03/29/2005		EXAMINER	
Crompton Corporation Benson Road Middlebury, CT 06749			SERGEANT, RABON A	
			ART UNIT	PAPER NUMBER
			1711	
DATE MAILED: 03/29/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

11

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/919,994	XIE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Rabon Sergeant	1711	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-12 and 14-30 is/are pending in the application.
- 4a) Of the above claim(s) 14-26 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 27, 29, and 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 25, 2005 has been entered.

2. Claims 1-4, 27, and 29 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Within claims 1 and 27, the language, "the initial unreacted diphenylmethane diisocyanate monomer", lacks antecedent basis.

3. Claims 1-5, 7-12, 27, 29, and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants' claims are ambiguous, because they are drafted in such a way that it is unclear if the passages pertaining to dissolving the (unreacted) diphenylmethane diisocyanate monomer pertain to dissolving the free diisocyanate monomer present after prepolymer formation or dissolving the initial charge of diisocyanate monomer prior to production of the prepolymer. Despite applicants' arguments, it is not clear from the claim language that the solvent is present from the beginning of the prepolymer formation process. The fact that applicants' process claim preamble reads, "A process for reducing the amount of residual diphenylmethane diisocyanate monomer in a polyurethane prepolymer reaction product", supports the examiner's position that the claims are ambiguous. One of ordinary skill would

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interpret the process as a method of treating an already formed prepolymer, as opposed to a method for producing a prepolymer. The claims cover distinctly different subject matter, depending on how they are interpreted.

4. Claims 1-5, 7-12, 27, 29, and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Firstly, within claim 1, support has not been provided for treating the residual diphenylmethane diisocyanate as claimed. As drafted, steps A) through D) of claim 1 treat the residual monomer that remains after the initial monomer has been reacted to form a prepolymer; however, the specification only provides support for treating the initial monomer in the manner claimed. Note that “the diphenylmethane diisocyanate monomer” within line 3 of the claim refers to the residual monomer within lines 1 and 2 of the claim.

Secondly, within claims 5 and 27, the claims specify a process wherein the unreacted or excess monomer is treated by dissolution within solvent and reaction with a polyol; however, this process of treating the unreacted or residual monomer is not supported by the specification. It is noted that the claims specifically state that the unreacted or excess monomer is removed by the recited process steps.

Applicants’ response to these two issues has been carefully considered; however, these issues remain valid in view of the aforementioned ambiguity of the claims.

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Lastly, despite applicants' response, support for amending the molecular weight of the high molecular weight polyol to be number average molecular weight has not been found. It is not seen that the argued language within page 16 of the specification provides support for the number average weight limitation as it pertains to the polyols of claim 9.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 5, 7-12, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Schnabel et al. ('171).

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Patentees disclose prepolymers having isocyanate monomer contents of less than 0.05 percent. Furthermore, patentees disclose reactants that meet those claimed. See abstract and columns 1-3. Patentees specifically disclose methylene-bis(4-phenyl) isocyanate at column 1, line 64.

7. Applicants' amendment pertaining to the solvent content is insufficient to remove the rejection. Product by process claims are examined as product claims, and the position is taken that while the amended solvent content is relevant to the process, the final prepolymer product is essentially devoid of solvent, since it has been removed by distillation. Similarly, patentees' prepolymer, after treatment (distillation), is essentially devoid of solvent. Therefore, the amendment fails to distinguish the claims from the prior art.

8. Claims 5, 9-12, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Dunlap et al. ('442).

Patentees disclose prepolymers having isocyanate monomer contents that meet applicants' claimed amounts. Furthermore, the reference discloses that the prepolymers may be derived from MDI. See abstract and columns 2-5 within Dunlap et al.

9. Applicants' argument pertaining to the process limitations and amendment pertaining to the solvent content are insufficient to remove the rejection. Product by process claims are examined as product claims, and the position is taken that applicants' argument and amendment are relevant only for the process. Applicants have not demonstrated that the process yields a patentably distinct product from the prior art. Furthermore, the final prepolymer product is essentially devoid of solvent, since it has been removed by distillation. Similarly, patentees'

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prepolymer, after treatment (distillation), is essentially devoid of solvent. Therefore, the amendment fails to distinguish the claims from the prior art.

10. Claims 1-5, 7-12, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Rosenberg et al. ('193).

Patentees disclose the removal of isocyanate monomers from isocyanate prepolymers, wherein solvents, which have boiling point properties that meet those of applicants' solvents, are added to the prepolymer reaction components at the start of prepolymer synthesis. The resulting solvent containing prepolymers are then subjected to distillation to obtain products having levels of isocyanate monomers that meet the instantly claimed levels. Furthermore, the reference discloses that MDI is a suitable diisocyanate for the process. See abstract and columns 2-6, especially column 6, lines 13+. The position is taken that the disclosure at column 6, lines 13+ is sufficient to anticipate applicants' initial isocyanate dissolving process step.

11. Applicants' arguments have been considered; however, they are insufficient to remove the prior art rejection. With respect to the product claims, the position is taken that the final prepolymer product is essentially devoid of solvent, since it has been removed by distillation. Similarly, patentees' prepolymer, after treatment (distillation), is essentially devoid of solvent. Therefore, the argument pertaining to the process step of using two different solvents fails to distinguish the product claims from the prior art. With respect to all of the claims, the position is taken that applicants' "comprising" language causes the claims to be open to the inclusion of additional components and processing steps, including the use of the argued additional solvent of the prior art. Despite applicants' remarks, it is by no means clear that the claim language definitively excludes the argued additional solvent.

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12. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schnabel et al. ('171) or Dunlap et al. ('442) or Rosenberg et al. ('193), each in view of Rizk et al. ('996) or Lander ('473).

As aforementioned within paragraphs 6-11, the primary references disclose polyurethane prepolymers having diisocyanate monomer contents that meet applicants' claimed monomer contents that are derived from diphenylmethane diisocyanate.

13. The primary references are silent regarding the reaction of the prepolymers with blocking agents to yield blocked isocyanate group containing prepolymers; however, the blocking of diphenylmethane diisocyanate derived prepolymers with conventional blocking agents, such as those claimed, to yield storage stable prepolymers was known at the time of invention. This position is supported by the disclosures and examples of Rizk et al. and Lander. Therefore, since the blocking of MDI prepolymers to obtain storage stable reactants and/or one-component coating or sealing compositions was a conventional practice at the time of invention, the position is taken that it would have been obvious to block the prepolymers of the primary references for the same reasons.

14. Product by process claims are examined as product claims. The process limitations are given patentable weight only if it has been established that the process causes the product to have different properties from the prior art product. In response, applicants have argued that the process limitations cause the instant products to have different properties from the prior art products, and have referred to the results set forth within Table 7 of the specification. The results within Table 7 have been considered; however, they in no way provide support for applicants' position. It is not seen how any meaningful conclusions can be drawn from the data



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of Table 7 since it appears that a MDI system is being compared to a TDI system. Furthermore, the TDI comparative system is not representative of the MDI compositions of the prior art, and the example of the invention is not commensurate in scope with the claim. Lastly, applicants argue that none of the prior art discloses how a prepolymer based upon MDI can be obtained having a residual MDI content of less than 0.3% and having the properties shown in Table 7. In response, Schnabel et al., Dunlap et al., and Rosenberg et al. each disclose residual monomer contents below 0.3%, and applicants have not established that the MDI compositions of the prior art, when blocked, will not have the argued properties. The position is taken that applicants' reliance on a TDI based comparative example is insufficient to support applicants' arguments concerning MDI.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.

R. Sergent  
March 16, 2005

  
RABON SERGENT  
PRIMARY EXAMINER